Andrew M. Stocker

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Education

University of Colorado Boulder (2016–2022)

- Ph.D in Mathematics (May 2022)
- Thesis Title: *Synchronizing Dynamical Systems, Groupoids, and C^*-Algebras*
- Advisor: Dr. Robin Deeley
- Graduate School Summer Fellowship (2020)

University of San Francisco (2013–2016)

- B.Sc. in Mathematics
- Graduated cum laude with a GPA of 3.99
- Batey Prize (2015) for most outstanding graduating student in mathematics

Research

Dynamical Systems (University of Colorado Boulder, 2019–*present*)

We are studying chaotic dynamical systems from the point of view of operator algebras. In particular we are interested in a certain class of dynamical systems which we have called *synchronizing systems*. These systems have desirable dynamical properties and we have constructed operator algebras encoding their asymptotic behavior.

Symbolic Dynamics (University of Colorado Boulder, 2021–*present*)

I am investigating symbolic dynamical systems that can be used to approximate the behavior of topological dynamical systems. In particular I am interested in describing the asymptotic behavior of these dynamical systems.

Applied Mathematics Research Assistant (University of California Los Angeles, 2015)

Researched particle laden fluid mechanics, including conducting empirical studies and numerical simulations.

Astrophysics Research Assistant (Lawrence Berkeley National Laboratory, 2014)

Researched supernova cosmology, specifically the effects of interstellar dust and how it affects distance measurements of type 1a supernovae. Worked extensively with Python and scientific computing libraries.

Publications and Pre-prints

- A. M. Stocker, *"Synchronizing Dynamical Systems: Shift Spaces and K-theory"*, arXiv:2208.06200
- R. J. Deeley and A. M. Stocker, *"Synchronizing Dynamical Systems: Their Groupoids and C^*-algebras"* arXiv:2206.04755 (conditionally accepted in Transactions of the AMS)
- R. Chaiser, M. Coates-Welsh, R. J. Deeley, A. Farhner, J. Giornozi, R. Huq, L. Lorenzo, J. Oyola-Cortes, M. Reardon, and A. M. Stocker, *"Invariants for the Smale space associated to an expanding endomorphism of a flat manifold"* arXiv:2208.02231 (accepted in Münster Journal of Mathematics)
- X. Huang, et al., "The Extinction Properties of and Distance to the Highly Reddened Type Ia Supernova SN 2012cu", The Astrophysics Journal

Conference Presentations

- *C^*-Algebras from Expansive Dynamical Systems.* May 12$^{\text{th}}$ 2021, GPOTS 2021, *virtual conference.*
- *Expansive Dynamical Systems and their C^*-algebras.* August 11$^{\text{th}}$ 2021, YMC*A 2021, University of Müenster, Müenster, Germany.
- *Expansive Dynamical Systems and their C^*-algebras.* September 20$^{\text{th}}$ 2021, University of Wyoming, Laramie, Wyoming.
- *C^*-Algebras of Expansive Dynamical Systems.* November 14$^{\text{th}}$ 2021, Groupoidfest 2021, University of Colorado Colorado Springs, Colorado Spring, Colorado.
- *Synchronizing Dynamical Systems.* March 8$^{\text{th}}$ 2022, Prague NCG&T Seminar, Institute of Mathematics, Czech Academy of Sciences, Prague, Czech Republic.
- *Synchronizing Dynamical Systems.* May 15$^{\text{th}}$ 2022, SmaleCon, University of Colorado Boulder, Boulder, Colorado.
- *C^*-Algebras From Shift Spaces.* May 26$^{\text{th}}$ 2022, GPOTS 2022, Washington University in St. Louis, St. Louis, Missouri.
- *C^*-Algebras From Shift Spaces.* July 13$^{\text{th}}$ 2022, KnOttowa, Kansas State University, Manhattan, Kansas.

Skills and Interests

Mathematics

I am well-versed in topology, analysis, linear algebra, and many other aspects of research mathematics. I am interested in mathematics in own right, but also in how mathematics and computer science intersect. In particular I am very interested in how category theory can be used to understand abstract systems.

Programming (*@amstocker* on GitHub)

I have held a long interest in programming and computer science that parallels my career in math. I have successfully worked with others on several projects in a professional capacity, and have also led many personal projects. I am interested in digital audio, distributed systems, and machine learning.

- First Place team in AccelerateSF 2015 Hackathon
- Extensive experience with Python
- Contributions to open source projects

Teaching

Instructor

Worked as primary instructor for several mathematics courses. Duties include creating course materials, writing exams, and being the main contact point for students. I wrote my own lectures and in-class activities, and participated in developing my own teaching skills and those of my peers.

- Data and Models (Fall 2022, Spring 2023)
- Calculus III (Spring 2021, Fall 2021)
- Calculus I (Fall 2017, Spring 2018)

Calulus II Assistant Coordinator (2019–2020)

My main duties included working with the graduate teaching assistants and undergraduate learning assistants on developing their teaching skills, and preparing new course materials that would be given to students. I have also developed a portfolio of activities for calculus students which reflect our active learning goals.

Teaching Assistant

Duties include leading recitations and facilitating group work with an emphasis on active learning. Also responsible for grading and tutoring students in the MARC (Mathematics Academic Resource Center).

Dynamical Systems REU with Dr. Robin Deeley (2021)

Duties for the REU (Research Experience for Undergraduates) include organizing a small group of driven undergraduate students in researching hyperbolic dynamical systems.

Burton W. Jones Teaching Excellence Award (2021–2022)

Service

Category Theory Seminar (2021)

Organized an introductory seminar for first and second year graduate students on category theory. We followed Emily Rhiel's book *Category Theory in Context*.

REU Program (2017, 2021)

I have been involved in the REU (Research Experience for Undergraduates) on several occasions at University of Colorado Boulder. Initially as a researcher in 2017, and later on as a leader in 2021.

Mathematics Department Graduate Mentor Program (2019–2021)

Worked as a mentor for first year mathematics graduate students. The goal of the mentor program is to help first year graduate students become part of the social and academic culture at CU Boulder. We meet several times throughout the semester to answer questions and advise the students on their first year courses and experiences.

Community Building (2016–2021)

Incoming student welcome weekend organizer. organized various dinner events, graduate student panels, and other activities. Additionally organized extracurricular events for the mathematics department, and participated in diversity committee events and teaching workshops.

Volunteer Work

Volunteered as a teacher for Sprout Up in San Francisco, where I taught elementary school children about environmentalism. Have also been a volunteer teacher for the San Francisco Math Circle after-school program.

References

Robin Deeley (robin.deeley@colorado.edu)

Lee Roberson (lee.roberson@colostate.edu)

Judith Packer (judith.jesudason@colorado.edu)

Ian Putnam (ifputnam@uvic.ca)